

Chest Pain Management In The Emergency Department By Attending Physicians: A Cross-Sectional Study

Mohammad Fuaad Kadamany¹, Riyadh Ibrahim Abdulrhman², Mojahed Hani Attar³

Abstract

Background: Chest pain is a frequent presentation in emergency departments, often indicative of serious conditions like acute coronary syndrome. Effective management in this context requires prompt and accurate assessment to ensure timely intervention. Despite its critical importance, there is a lack of consensus on the optimal approach to chest pain management, prompting the need for empirical investigation into the practices and decision-making processes of attending physicians in this setting.

Methods: This was a cross-sectional study involving a survey of attending physicians in emergency departments. The survey consisted of questions about demographics, practice patterns, and management of chest pain patients. The data collected was analyzed using descriptive statistics and inferential statistics. The sample consisted of attending physicians working in emergency departments. A convenience sample was used and physicians were recruited through email and social media or face to face.

Results: This cross-sectional study involving 103 physicians explored chest pain management practices in the emergency department. The participants' demographics revealed a predominantly male cohort (71.8%), with an average age of 31.4 years and a median experience of 3 years. Table 2 illustrated the prominence of chest pain cases, with 69.9% of physicians encountering them "Almost always." Their initial assessment strategies exhibited a preference for comprehensive evaluation (78.6%) involving clinical assessment, ECG, chest X-ray, and blood tests. Most physicians (83.6%) favored a comprehensive diagnostic approach. Noteworthy attitudes emerged in Table 3, as 81.5% expressed confidence in diagnosing chest pain, and 69.9% and 26.2% considered systematic management "Very important" and "Important," respectively. Risk stratification tool usage was substantial (81.6%). The associations between demographic factors and outcomes was examined, suggesting nuanced gender, age, experience, and specialty influences on management practices.

Conclusion: Research findings underscore the prominence of chest pain cases in the emergency department and reveal a preference for comprehensive assessment and diagnostic approaches. Physicians express confidence in diagnosis and emphasize the significance of

¹Emergency Medicine Consultant Heraa General Hospital, Makkah, KSA.

²Emergency Medicine Senior Registrar King Abdulaziz Hospital, Makkah, KSA.

³Emergency Medicine Resident King Abdullah Medical City, Makkah, KSA.

systematic management. The substantial utilization of risk stratification tools highlights a commitment to evidence-driven care. Demographic factors exhibit nuanced associations with management practices. This study offers valuable insights into contemporary chest pain management and underscores the need for continued research in this vital clinical domain.

Introduction

Chest pain constitutes a frequently encountered presentation within emergency departments and can be indicative of critical conditions such as acute coronary syndrome, pericarditis, or aortic dissection [1]. Effectively addressing chest pain in the emergency department poses intricate challenges, necessitating a swift and precise evaluation of the patient's clinical status [2-3].

Despite the profound significance attributed to the management of chest pain, a prevailing lack of consensus persists regarding the optimal approach to its mitigation [4]. This ambiguity emanates from the multifaceted etiology underlying chest pain, engendering varied management paradigms contingent upon the underlying diagnosis. Noteworthy diagnostic modalities harnessed in the scrutiny of chest pain encompass electrocardiography (ECG), thoracic radiography, and serological assays [5-6]. Therapeutic interventions encompass a spectrum encompassing analgesic pharmacotherapy, anti-inflammatory agents, and antiplatelet medications. In instances of heightened severity, invasive interventions such as coronary angiography or percutaneous coronary intervention may warrant consideration [7-9].

Empirical investigations focused on the emergency department management of chest pain by attending physicians have been relatively sparse. These inquiries have unveiled a discernible diversity in the therapeutic approaches embraced, delineating a divergence between those gravitating towards reliance on diagnostic testing and those placing greater emphasis upon clinical acumen [10]. Furthermore, empirical evidence surfaces suggesting a potential nexus between demographic attributes inclusive of age, gender, and professional tenure, and the strategic course adopted in the management of chest pain [11].

Against the backdrop of these discernments, a cogent comprehension of prevailing practices espoused by attending physicians pertaining to chest pain management within the emergency milieu is imperative [12]. Such insights bear profound implications in engendering meticulously derived guidelines informed by empirical evidence, thereby orchestrating an optimal framework for chest pain management. Furthermore, the discernment of potential incongruities in therapeutic disposition contingent upon attending physicians' demographic characteristics assumes paramount importance, as it can serve as a prism for identifying domains warranting augmented educational or preparatory interventions, thereby ameliorating the caliber of patient care [13-15].

The orchestration of chest pain management within the precincts of the emergency department is a nuanced and intricate endeavor, necessitating a systematic approach underpinned by clinical acumen and empirical insights [16]. While the exigency of effective chest pain management remains indisputable, the paucity of a unified directive underscores the necessity for scrutinizing the prevailing practices of attending physicians in this realm. The ensuing findings are poised to wield pivotal influence, proffering foundational support for the formulation of evidence-grounded protocols governing chest pain management, and concurrently proffering nuanced recommendations aimed at enriching the continuum of medical education accessible to attending physicians.

Methods

Study design

This was a cross-sectional study involving a survey of attending physicians in emergency departments. The survey consisted of questions about demographics, practice patterns, and management of chest pain patients. The data collected was analyzed using descriptive statistics and inferential statistics.

Sample, Sampling and Data Collection

The sample consisted of attending physicians working in emergency departments. A convenience sample was used and physicians were recruited through email and social media or face to face.

Instruments

Study instruments included demographic characteristics, management of chest pain in the emergency department and attitudes and beliefs about management of chest pain.

Data Analysis

Data collected from the surveys was analyzed using descriptive statistics to determine the distribution of the variables of interest. Inferential statistics were used to determine if there are significant differences in management of chest pain by attending physicians based on demographic characteristics such as age, gender, and years of experience.

Ethical consideration

Ethical approval was gained from (institution) and (hospital). Study objectives were explained to participants and oral informed consent was obtained from participants.

Results

Demographic characteristics

The study included 103 physicians. The mean age among participants was 31.4 ± 5.83 years with median age of 31 years. Participants' age ranged from 25 to 70 years. More than two thirds of participants were males (n= 74, 71.8%) and the rest were females (n= 29, 28.2%). Participants had different durations of experience with median duration of 3 years. Most of participants were emergency room (ER) physicians (n= 86, 83.5%). Table 1 presents demographic characteristics of study participants.

Demographic characteristic		Frequency	Percent
Gender	Male	79	71.8%
	Female	29	28.2%
Age	>30 years	50	48.5%
	30-49 years	52	50.5%
	50-60 years	1	1%

Experience	=<5 years	86	83.5%
	6-10 years	12	11.7%
	11-15 years	4	3.8%
	16-20 years	1	1%
Specialty	ER physician	86	83.5%
	General Practitioner	11	10.7%
	Cardiologist	4	3.8%
	Internal Medicine	2	2%

Management of Chest Pain in the Emergency Department

Table 2 provides a comprehensive overview of the prevailing practices adopted by physicians when addressing patients presenting with chest pain in the emergency department. The table reveals the distribution of physician encounters with patients presenting chest pain in the emergency department. A substantial majority of physicians (69.9%) indicate an "Almost always" occurrence of chest pain cases, underscoring the considerable prominence of this presentation in the emergency setting. The strategies employed by physicians during the initial evaluation of patients with chest pain. Among the chosen approaches, "More than one assessment of the above" emerges as the preferred choice (78.6%), indicating a tendency towards comprehensive evaluation involving clinical assessment, electrocardiogram (ECG), chest X-ray, and blood tests. Physicians' diagnostic preferences for evaluating chest pain are enumerated in this segment. The majority of physicians (83.6%) opt for a comprehensive approach, endorsing "More than one evaluation of the above" as their preferred diagnostic modality. Physicians' inclinations towards ordering advanced diagnostic tests, such as coronary angiography or computed tomography angiography, are delineated. The responses exhibit a balanced distribution, with 42.7% opting for a "High risk" threshold and 41.7% relying on "Based on clinical judgment." Physicians' methodologies for assessing the risk of acute coronary syndrome in chest pain patients are articulated in this section. "More than one evaluation of the above" is favored by the majority (89.3%), indicating a propensity for employing a combination of clinical assessment, ECG, and blood tests. Physicians' preferred treatment strategies for chest pain patients in the emergency department are delineated. The data portrays a comprehensive approach, with 77.6% of physicians favoring multifaceted management strategies.

Table 2: Management practice by physicians included in this study		
Item	Frequency	Percent
How often do you encounter patients presenting with chest pain in the emergency department?		
a. Rarely	2	1.9%
b. Occasionally	6	5.8%
c. Frequently	23	22.3%
d. Almost always	72	69.9%
What is your initial approach to the evaluation of a patient presenting with chest pain? (Check all that apply)		
a. Clinical assessment	7	6.8%
b. Electrocardiogram (ECG)	12	11.7%
c. Chest X-ray	1	1%
d. Blood tests (e.g. troponin, creatinine kinase)	2	1.9%

e. More than one assessment of the above	81	78.6%
Which diagnostic tests do you typically order in the evaluation of chest pain? (Check all that apply)		
a. Electrocardiogram (ECG)	9	8.7%
b. Chest X-ray	2	1.9%
c. Blood tests (e.g. troponin, creatinine kinase)	6	5.8%
d. More than one evaluation of the above	86	83.6%
What is your threshold for ordering advanced diagnostic tests such as coronary angiography or computed tomography angiography?		
a. High risk	44	42.7%
b. Intermediate risk	13	12.6%
c. Low risk	3	2.9%
d. Based on clinical judgment	43	41.7%
How do you assess the risk of acute coronary syndrome in patients presenting with chest pain? (Check all that apply)		
a. Clinical assessment	4	3.9%
b. Electrocardiogram (ECG)	5	4.9%
c. Blood tests (e.g. troponin, creatinine kinase)	2	1.9%
d. More than one evaluation of the above	92	89.3%
What is your typical approach to the treatment of chest pain in the emergency department? (Check all that apply)		
a. Pain relief medication	5	4.9%
b. Anti-inflammatory medication	6	5.8%
c. Anti-platelet medication	8	7.8%
d. Invasive procedures (e.g. coronary angiography, percutaneous coronary intervention)	1	1%
e. Observation	3	2.9%
f. More than one management of the above	80	77.6%
How do you determine the discharge destination for patients presenting with chest pain? (Check all that apply)		
a. Home	51	49.5%
b. Observation unit	37	36%
c. Inpatient admission	11	10.6%
d. Combined based on patients' condition	4	3.9%

Attitudes and Beliefs towards Chest Pain Management

Table 3 presents noteworthy insights into the attitudes and beliefs of physicians regarding chest pain management within the emergency department. Physicians were queried about their level of confidence in diagnosing the cause of chest pain in the emergency department. Notably, a

substantial majority of respondents (81.5%) express confidence or higher levels of confidence. Physicians' perspectives on the significance of adopting a systematic approach to chest pain management were assessed. The data unveils a resounding affirmation of systematic practices, with 69.9% of respondents attributing "Very important" status to employing a methodical framework. An additional 26.2% of physicians regard it as "Important," collectively underscoring the pronounced significance of systematic management in the emergency context. The usage of specific scales or tools to stratify the risk of adverse events in patients with chest pain was explored. Impressively, a substantial proportion (81.6%) of physicians confirm the employment of such risk stratification tools.

How confident do you feel in your ability to diagnose the cause of chest pain in the emergency department?		
a. Not at all confident	1	1%
b. Somewhat confident	18	17.5%
c. Confident	67	65%
d. Very confident	17	16.5%
How important do you believe it is to use a systematic approach to the management of chest pain in the emergency department?		
a. Not important	-	-
b. Somewhat important	4	3.9%
c. Important	27	26.2%
d. Very important	72	69.9%
Do you use any specific scale or tool to stratify the risk of adverse events in patients presenting with chest pain in the emergency department?		
a. Yes	84	81.6%
b. No	19	18.4%

Table 4 outlines demographic factors' relationship with outcomes in chest pain management. Gender disparities initially suggest lower odds for males (OR=0.339), but this effect diminishes after adjustment (OR=1.404). Age groups "30-49 years" and "50-60 years" display potential negative associations, although significance wanes upon adjustment. Experience "6-10 years" suggests lower odds (OR=0.256), sustained post-adjustment (OR=0.774). Specialty differences imply reduced odds across all, but adjusted ORs lack significance.

Demographic characteristic		Crude OR	Adjusted OR	95% C.I. for OR		P-value
				Lower	Upper	
Gender	Male	0.339	1.404	0.889	2.218	0.146
	Female	1	1			
Age	>30 years	1	1			
	30-49 years	0.782	2.185	0.426	11.200	0.348
	50-60 years	0.780	20182	0.535	8.904	0.277
Experience	=<5 years	1	1			
	6-10 years	0.256	0.774	0.431	1.391	0.392
	11-15 years	0.333	1.395	0.772	2.520	0.270
	16-20 years	0.511	1.668	0.984	2.827	0.058
Specialty	ER physician	1	1			
	General Practitioner	0.619	0.538	0.228	1.270	0.157

	Cardiologist	0.660	0.517	0.193	1.386	0.190
	Internal Medicine	0.432	0.649	0.225	1.872	0.424

Discussion

Chest pain presentations within the emergency department constitute a cardinal challenge due to their diverse etiologies and potential life-threatening implications. This study endeavors to shed light on the contemporary practices, attitudes, and beliefs of physicians concerning chest pain management. By juxtaposing the obtained results with existing literature and exploring implications, this discussion elucidates the insights gleaned and their broader implications.

The current study's table 1 reveals a remarkable level of diagnostic confidence among physicians. A majority (81.5%) reported feeling at least "Somewhat confident" in diagnosing the cause of chest pain. This is a salient finding, as diagnostic accuracy significantly impacts patient outcomes. The substantial proportion of physicians exhibiting confidence suggests that they possess a solid foundation in clinical assessment and diagnostics, thereby substantiating their credibility in the acute care setting. This result underscores the expertise of physicians in this cohort, potentially stemming from advances in medical education and continuous professional development.

Further aligning with the notion of proficiency, the significance attributed to systematic approaches to chest pain management emerges as another pivotal finding. With 69.9% of physicians deeming a systematic approach "Very important," and an additional 26.2% considering it "Important," a clear consensus is evident. These figures underscore a collective recognition of the value of methodical frameworks in navigating the intricacies of chest pain evaluation and management. The emphasis on systematic approaches resonates with the broader medical paradigm shift towards evidence-based practices and standardized clinical protocols.

The integration of risk stratification tools into clinical practice emerges as a focal point in this investigation. A noteworthy majority (81.6%) of physicians acknowledged the utilization of specific scales or tools to stratify the risk of adverse events in chest pain patients. This outcome suggests an increased reliance on evidence-driven approaches to decision-making. Such tools, by facilitating risk assessment, enable more precise patient management, thereby optimizing resource allocation and patient outcomes.

When contextualizing these findings within the existing literature, intriguing contrasts and concurrences come to light. Notably, the high diagnostic confidence observed here aligns with some earlier studies [17-18], signifying a robust trend among physicians in various contexts. However, divergent results have also been documented [19], emphasizing the contextual variability in physician confidence and the need for continuous evaluation.

The consistent emphasis on systematic management within the current study is congruent with prior research [20]. This parallels the evolution of emergency medicine as a discipline anchored in standardized practices [21]. Moreover, the prevalence of risk stratification tool usage echoes broader trends [22], reflecting a maturing approach to risk assessment in emergency settings.

The implications of these findings are multifold. The demonstrated diagnostic confidence and emphasis on systematic management suggest that contemporary physicians are well-equipped

to address the complexity of chest pain presentations. The integration of risk stratification tools underscores an era of personalized medicine in emergency care. Collectively, these results advocate for the optimization of healthcare delivery by aligning practices with evidence-based approaches.

Future research avenues could explore the associations between physicians' demographic attributes, years of experience, and their diagnostic confidence, risk assessment practices, and attitudes towards systematic management. Additionally, qualitative studies could delve into the factors contributing to the observed diagnostic confidence and attitudes, further unraveling the intricacies of physician decision-making in acute care scenarios.

Conclusion

In the realm of chest pain management within the emergency department, this study provides insightful glimpses into contemporary physician practices, diagnostic confidence, and attitudes towards systematic management and risk assessment. The results underscore the medical community's dedication to informed, structured, and evidence-grounded patient care. By amalgamating diagnostic expertise, systematic approaches, and risk stratification tools, physicians are poised to navigate the intricate landscape of chest pain presentations, ultimately optimizing patient outcomes and advancing the frontiers of emergency medicine.

Availability of data

Data is available upon reasonable request

Funding

None

Competing interest

Authors declare that they have no conflict of interest

Corresponding author

References

1. Croskerry P. The Cognitive Imperative Thinking about How We Think. *Academic Emergency Medicine*. 2000Nov;7(11):1223–31.
2. Australian Institute of Health and Welfare. Emergency department care 2017–18 Australian hospital statistics [Internet]. Canberra, ACT: Australian Government; 2018. <https://www.aihw.gov.au/reports/hospitals/emergency-department-care-2017-18/contents/table-of-contents>
3. Thygesen K, Alpert JS, Jaffe AS, Chaitman BR, Bax JJ, Morrow DA, et al. Fourth Universal Definition of Myocardial Infarction (2018). *Circulation*. 2018Nov13;138(20):e618–51.
4. Kumar A, Cannon CP. Acute Coronary Syndromes: Diagnosis and Management, Part I. *Mayo Clinic Proceedings*. 2009Oct;84(10):917–38.

5. Kohn MA, Kwan E, Gupta M, Tabas JA. Prevalence of acute myocardial infarction and other serious diagnoses in patients presenting to an urban emergency department with chest pain. *J Emerg Med*. 2005Nov;29(4):383–90.
6. Anderson JL, Adams CD, Antman EM, Bridges CR, Califf RM, Casey DE Jr, et al, American College of Cardiology., American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction)., American College of Emergency Physicians., Society for Cardiovascular Angiography and Interventions., Society of Thoracic Surgeons., American Association of Cardiovascular and Pulmonary Rehabilitation., Society for Academic Emergency
7. Swap CJ, Nagurney JT. Value and limitations of chest pain history in the evaluation of patients with suspected acute coronary syndromes [published correction appears in *JAMA*. 2006 May 17;295(19):2250]. *JAMA*. 2005;294(20):2623–2629.
8. Antman EM, Cohen M, Bernink PJLM, McCabe CH, Hoacek T, Papuchis G, et al. The TIMI risk score for unstable angina/non-ST elevation MI: a method for prognostication and therapeutic decision making *JAMA*. 2000;284(7):835–42.
9. Six AJ, Backus BE, Kelder JC. Chest pain in the emergency room: value of the HEART score. *Neth Heart J*. 2008;16(6):191–6.
10. Fernando SM, Tran A, Cheng W, Rochweg B, Taljaard M, Thiruganasambandamoorthy V, et al. Prognostic Accuracy of the HEART Score for Prediction of Major Adverse Cardiac Events in Patients Presenting With Chest Pain: A Systematic Review and Meta-analysis. *Acad Emerg Med*. 2019Feb;26(2):140–151.
11. Moy E, Barrett M, Coffey R, et al. Missed diagnoses of acute myocardial infarction in the emergency department: variation by patient and facility characteristics. *J AHRQ Patient Safety Network*. <https://psnet.ahrq.gov/resources/resource/28747/missed-diagnoses-of-acute-myocardial-infarction-in-the-emergency-department-variation-by-patient-and-facility-characteristics>. Accessed February 8, 2023.
12. Lancet The. Artificial intelligence in health care: within touching distance. *Lancet*. 2018Dec23;390(10114):2739.
13. Stewart J, Sprivulis P, Dwivedi G. Artificial intelligence and machine learning in emergency medicine. *Emerg Med Australas*. 2018Dec;30(6):870–874.
14. Baxt WG. Use of an Artificial Neural Network for Data Analysis in Clinical Decision-Making: The Diagnosis of Acute Coronary Occlusion. *Neural Computation*. 1990Dec;2(4):480–9.
15. Oxford. Artificial Intelligence. English Oxford Living Dictionaries. 2018. [Cited 8 Feb 2023.] URL: https://en.oxforddictionaries.com/definition/artificial_intelligence
16. Jiang F, Jiang Y, Zhi H, Dong Y, Li H, Ma S, et al. Artificial intelligence in healthcare: past, present and future. *Stroke and Vascular Neurology*. 2017Dec;2(4):230–43.
17. Hutzler S, Simmons M, Guardiola J, Richman PB. Accuracy of Emergency Department Chest Pain Patients' Reporting of Coronary Disease History. *Journal of Emergencies, Trauma, and Shock*. 2022 Jan;15(1):35.

18. Buntinx F, Knockaert D, Bruyninckx R, De Blaey N, Aerts M, Knottnerus JA, Delooz H. Chest pain in general practice or in the hospital emergency department: is it the same?. *Family practice*. 2001 Dec 1;18(6):586-9.
19. Wigder HN, Arai DA, Narasimhan K, Cohan S. ACEP chest pain policy: emergency physician awareness. *Annals of emergency medicine*. 1996 May 1;27(5):606-9.
20. Richards CR, Richell-Herren K, Mackway-Jones K. Emergency management of chest pain: patient satisfaction with an emergency department based six hour rule out myocardial infarction protocol. *Emergency medicine journal*. 2002 Mar 1;19(2):122-5.
21. Henricson J, Ekelund U, Hartman J, Ziegler B, Kurland L, Björk Wilhelms D. Pathways to the emergency department-a national, cross-sectional study in Sweden. *BMC emergency medicine*. 2022 Dec;22(1):1-9.
22. Ng M, Tan HJ, Gao F, Tan JW, Lim SH, Ong ME, Ponampalam R. Comparative prospective study of the performance of chest pain scores and clinical assessment in an emergency department cohort in Singapore. *Journal of the American College of Emergency Physicians Open*. 2020 Oct;1(5):723-9.